We claim

1. A telecommunications system for establishing a desired communication between two points, comprising:

a plurality of telecommunication links to transport data packets;

a plurality of telecommunication nodes connected by the telecommunication links;

an operating system distributed on the telecommunication nodes and operable to:

(i) identify at least two operating system functions required to effect the desired communication between the first and second points, each operating system function including a defined time limit for execution of the function;

(ii) select a different telecommunication node on which each operating system function is to execute, based upon criteria including the ability of the selected node to execute the operating system function within the respective defined time limits; and

(iv) instantiate and execute each operating system function to accomplish the desired data communication through a set of telecommunication nodes, including the selected nodes, and telecommunication links of said telecommunication system.

2. The telecommunication system as claimed in claim 1, wherein the at least two telecommunication links employed to accomplish the desired telecommunication use different protocols and the operating system is operable to identify operating system functions to convert data of said desired communication to required protocols and to select appropriate telecommunication nodes to instantiate and execute these operating system functions.

3. The telecommunication system as claimed in claim 1 or 2 wherein a first one of the at least two operating system functions adds a time stamp to each data packet of the desired communication received from the first point and a second one of the at least two operating system functions examines the time stamp of each data packet of the desired communication received at the second point and arranges the order and timing of those packets according to the time stamps.

4. The telecommunication system as claimed in claim 3 wherein the time stamps are generated from a global positioning system reference.

5. The telecommunication system as claimed in claim 3 wherein the time stamps are generated from a system clock available in one of the telecommunication s links.

6. The telecommunication system as claimed in any one of claims 1 through 5 wherein the operating system is further operable to:

(a) determine the computational requirements of each operating system function; and

(b) determine the unused computational resources of telecommunication nodes; and

the selection of telecommunication nodes in step (iii) includes considering the computational requirements of the operating system functions identified in step (ii) and the unused computational resources of the telecommunication nodes to balance computational loads of said telecommunication nodes.

7. The telecommunications system as claimed in claim 6 further comprising the step of monitoring, during the desired communication, the use of computational resources at nodes participating in the desired communication and re-performing step (iii) if the desired communication does not meet preset quality of service levels due to computational loading at a node.

8. The telecommunication system of claims 1 through 7 wherein the available operating system functions also include encryption and decryption services.

9. The telecommunication system of claims 1 through 7 wherein the available operating system functions also include traffic shaping services.

10. The telecommunication system of claims 1 through 7 wherein the available operating system functions also include data compression and decompression services.

11. The telecommunication system of claims 1 through 7 wherein the available operating system functions also include voice data combiner services for teleconferencing.

12. The telecommunication system of claims 1 through 7 wherein at least one of the network nodes is a gateway between a packet network and the public switched telephone system.